

7 layers having lattice constants that differ from adjacent layers by less than 1%, and a
final alloy layer having a lattice constant that is substantially different from the
9 substrate, wherein growth temperature of the final alloy layer is at least 20°C less than
10 the growth temperature of the first alloy layer.

1 31 (Amended). The method claim of claim 27, wherein the strain balancing semiconductor
B2 layer comprises an epitaxial layer.

1 32 (Amended). The method claim of claim 27, wherein the strain balancing semiconductor
2 layer comprises a wafer-bonded layer.

1 55 (New). A semiconductor structure comprising:

2 a single crystal semiconductor substrate of GaP; and

3 a graded composition buffer including a plurality of epitaxial semiconductor
4 $\text{In}_x(\text{Al}_y\text{Ga}_{1-y})_{1-x}\text{P}$ alloy layers, said buffer comprising a first alloy layer immediately
B3 contacting the substrate having a lattice constant that is nearly identical to that of the
6 substrate and a growth temperature greater than 650°C, subsequent alloy layers having
7 lattice constants that differ from adjacent layers by less than 1%, and a final alloy layer
8 having a lattice constant that is substantially different from the substrate, wherein growth
9 temperature of the final alloy layer is at least 20°C less than the growth temperature of
10 the first alloy layer.

1 56 (New). A method of forming a semiconductor structure comprising:

2 providing a single crystal semiconductor substrate of GaP; and